

Bhopal Gas Disaster and Dow Chemical: Need for CSR

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"... All of a sudden he started coughing and in the meantime he heard screams coming from outside. As soon as my husband opened the door all we could see was smoke entering our house. Then everyone in my family started coughing and my kids started complaining of their eyes burning. Then we heard someone saying that we should all run because some gas pipe has exploded in the Union Carbide factory. We all started running and eventually I got separated from my family. I just remember not being able to locate my family and then after that I had lost consciousness."

- Victim

"There were thousands of bodies. There were bodies everywhere. And people were dying all round."

- Victim

ISSUE

The Disaster at Union Carbide Corporation (UCC) plant on early morning of 3rd Dec'1984, released 40 tons of poisonous methyl isocyanate¹ gas from its pesticide plant in Bhopal. The aftermath of the disaster left 15,000 dead, numerous ill, with a polluted environment that is yet to recover. Even after two decades, telltale signs of the disaster were evident. The victims of the disaster were yet to receive their compensation package and medical help from the company.

This was an industrial disaster with a complexity of violations of civil, political, economic and social rights carried over a period of twenty years which necessarily demanded a humanitarian approach and called for corporate social responsibility (CSR)².

¹ A crystalline compound, C₂H₃NS, used as a pesticide. It is an extremely toxic chemical that can come in contact inhalation, ingestion and contact in quantities as low as 0.4 ppm. Damage includes coughing, chest pain, dyspnea, asthma, irritation of the eyes, nose and throat as well as skin damage.

² CSR is about how companies manage the business processes to produce an overall positive impact on society.

ABOUT THE DISASTER

UCC's plant at Bhopal manufactured pesticide. The plant was set in 1969 and expanded in 1979 to produce carbaryl. The manufacturing process of carbaryl produced an intermediate product called methyl isocyanate (MIC) (**Annexure1**). The disaster happened when water entered the holding tanks of MIC through leaking valves. The temperature at the MIC tank instead of being set at zero degrees centigrade (as required) was not maintained by the officials to save electricity bills. The water used for washing the lines entered the MIC tank which was kept at ambient temperature instead of zero degree. The reaction triggered an exothermic³ reaction that released large volume of toxic gas. The leakage of poisonous gas could have been controlled by taking adequate safety measures, with proper working of scrubbers⁴ and vents. But unfortunately all the safety measures failed to work. The scrubbers were off-line for repairs and the safety procedures were also not in account as a "cost cutting operations" at the Indian Plant of Union Carbide.

According to the safety manuals it was advised that the refrigeration unit should be switched off and the vent gas scrubber must be shut down when the plant was not in operation. The staffs at the MIC unit were reduced to 6 from 12. On the night of disaster, the refrigeration unit installed to cool MIC and prevent chemical reactions had been shut for three months; the vent gas scrubber had been shut off for maintenance; the flare tower had been shut off; there were no effective alarm systems in place; the water sprayers were incapable of reaching the flare towers; the temperature and pressure gauges were malfunctioning; tank number 610 for storing MIC was filled above recommended capacity; and, the standby tank for use in case of excess already contained MIC. On 29 November 1984, UCC decided to dismantle the plant and ship it to Indonesia or Brazil. The feasibility report for this was completed on 29 November, three days before the disaster.⁵

³ An exothermic process is one that gives off heat. This heat is transferred to the surroundings

⁴ Scrubbers are air pollution control devices that use a high-energy liquid spray to remove aerosol and gaseous pollutants from an air stream. The gases are removed either by absorption or chemical reaction.

⁵ Source: Dateline Bhopal, <http://www.india-seminar.com/2004/544/544%20s.%20muralidhar.htm>

Extent of Loss

The disaster killed more than 15,000 and caused serious harm to a large number of people. Till 20 years of the disaster, 25,000 tons of toxic waste remained in its premises, which continued to pollute the surrounding water bodies. Around 100,000 people suffered from "chronic and debilitating illnesses"⁶ and painful effects of gas leak and were yet to receive adequate compensation or medical treatment which was a major breach of human rights. **(Annexure 2)**

It had caused blindness, respiratory trouble and, gynaecological disorders in the victims. On the other hand it contaminated the local groundwater and wells with mercury at level of 20,000 units. Trichloroethene were over 50 times higher than Environment Protection Act (EPA) safety limits which were the major cause of impaired foetal development. A report published in 2002 revealed poisons such as 1,3,5 trichlorobenzene, dichloromethane, chloroform, lead and mercury in nursing mothers which affected the new born from their birth. It also released hydrogen cyanide, a carcinogenic gas, but Union Carbide denied the fact.

UNION CARBIDE CORPORATION

Union Carbide was formed in 1917 by the merger of 5 separate US companies, had the name Union Carbide & Carbon Corporation that acquired the stocks of Linde Air Products Co.; National Carbon Co., Inc.; Prest-O-Lite Co., Inc.; and Union Carbide Company (formed in 1898). During 1920-1930 it was the world leader on ethylene and polymers such as Poly-vinyl chloride (PVC). In 1957 Union carbide and Carbon Corporation changed its name to Union Carbide Corporation. By 1963, it was the world's second largest chemical company with a diversified range of products. By 1979 UCC ranked seventh among chemical companies in the world, and third largest in the US. In 1974 UCC announced to set up a pesticide factory in Bhopal, in India. The Union Carbide India Ltd. was a closely held company (50.9%) owned by the US parent company, Union Carbide. A similar plant in West Virginia had better technological backup as compared to its Indian counterpart. The Indian plant imported inferior

⁶ Long lasting feebleness or weakness of health

technology with negligible safety measures which led to the disaster. The gas leak on 3rd December 1984 was the result of such policies. After the incident, it went into several tie ups with various companies. And ultimately on 4th August 1999 , UCC and Dow announced that the board of directors approved an \$11.6 billion transaction among them which would lead UCC to become a wholly owned subsidiary of The Dow Chemical Company. On Feb 6th 2001 Union Carbide Corporation formally became a wholly owned subsidiary of The Dow Chemical Company with all assets and liabilities.

(Annexure 3)

DOW CHEMICAL IN INDIA

Dow Chemical was the world's largest producer of plastics, and with the acquisition of Union Carbide, it became a major player in the petrochemical industry as well.

(Annexure 4)

It bought all shares of UCC, India in 2001 and were present in the country as:

- Dow Chemical (India) Holdings Private Limited held by Dow Chemical Pacific
- Dow Chemical International Pvt. Lmt.
- Anabond Essex India Private Limited held by the ortell Company (50%)
- Dow Polymers Pvt. Lmt
- DE Nocil Crop Protection Ltd. (Joint Venture)
- Dow Corning India P Ltd Dow Corning Singapore Pvt. Ltd., Singapore Pvt. Ltd, Singapore **(Annexure 5)**

According to Dow Chemical Management, before acquiring UCC, it thoroughly investigated the matter of disaster and did not take any liabilities. At an annual general meeting of 2003 the CEO of Dow, William S. Starvropoulos stated that the case of disaster had been resolved in court and the company was not liable for any further action. Thus during the takeover, Dow declared not to take any legal responsibility for Carbide's past actions. It failed to be present at any of the court's hearing. The Chief Bhopal Magistrate listed Dow's subsidiary, Union Carbide to be "absconder from justice".

FINANCIAL STATUS OF DOW CHEMICAL

According to the financial report of Dow it had been a very stable and profit earning company which could have done more towards social responsibility and Bhopal victims. **(Exhibit 1)**. Dow Chemical had positioned well among its competitors. It ranked second in market capitalization. **(Exhibit 2)**

The annual sales in 2003 increased more than \$5000 million and the annual income rose to 5 folds as compared to 2002. Being financially sound and stable the company did not raise the amount of the compensation package. **(Exhibit3)** The company during 2003 operated in 37 countries with 180 manufacturing sites. It manufactured and sold chemicals, plastic materials, agricultural and other specialized products and services. It catered to segments like: performance plastics, performance chemicals, agricultural products, plastics, chemicals, and hydrocarbons and energy. The major industries with which it dealt were appliance, automotive, agricultural, building and construction, chemical processing, electronics, furniture, housewares, insurance and finance, oil and gas, packaging, paints, coatings, adhesives, personal care, pharmaceutical, processed foods, paper, textile, utilities and water treatment.

CORPORATE FAILURE

The plant of UCC in India and West Virginia underwent safety audit in May 1982. The results of safety audit pointed out many deficiencies in the working system of the plant and warned about the possible dangers from the plant. According to the results of audit, the remedial measures were implemented at Union Carbide's MIC plant in West Virginia but no actions were taken at the Indian plant as a cost cutting measure. Before the disaster, the plant was making a loss of \$4.5 million and looking for a buyer. Thus the company did not take any precautionary action against the safety audit report.

Studies show that the parent company, in response to promotion of import substitution through dilution of foreign equity (The Foreign Exchange Regulatory Act- FERA) reduced investment in its Bhopal plant. Earlier it was \$28 million that had gone down to \$20.6 million. Under FERA, UCC transferred all substandard and inferior technology to the Indian Plant to lower down the cost that posed hazard to the plant. The inadequate safety and disaster management measures were the cause of accident which, were

always overlooked and untreated. It was a major failure by the management. But the company asserted the accident as a case of sabotage, to shirk away their responsibility.

COMPENSATION AND BREACH OF HUMAN RIGHTS

After the disaster both civil and criminal cases were leveled against Union Carbide and its Indian subsidiary, Union Carbide India Ltd. The Supreme Court approved a settlement money of US\$ 470 million for civil and criminal claims to secure immediate relief to the victims in 1989. This amount of compensation was based on the assumption, that the number of deaths were 3000 and the number of injured were 1,00,000. But according to the figures calculated as on March 2003 the death claim stood more than 15,180 and injured at 5,53,015 which was miscalculated to around 5 times. The compensation money was not increased according to the actual data and thus it reduced by 5 times or more leaving back an average monetary rehabilitation of Rs 200 per person per year. It was an unsatisfactory amount for the victims of gas disaster of such a large scale. It was a complete breach of human rights with inadequate compensation package leading to a helpless situation to the victims. The battle for justice within US and Indian courts had so far been unsuccessful for better compensation and treatment for victims, and decontamination of the Bhopal site.

The Company failed to attend judicial action, which showed their reluctance and disregard towards employee and the environment. Warren Anderson, the CEO of UCC at the time of the disaster, was a fugitive from the law. He failed to appear in the court hearing called by the Chief Judicial Magistrate of Bhopal which proved their attitude towards the incident. Anderson absconded in fear of imprisonment which was for a span of 10 years. Later after the takeover the CEO of Dow, William S. Starvropoulos, stated their helplessness towards the accident.

ROLE OF GOVERNMENT

The Government agencies and other statutory bodies declined to take any criminal action or charges against the industry knowing fully well, that the factory were dealing with killer chemicals at the heart of the city with poor safety measures.

After the disaster, the Government was confused about the actions to be taken against the company and the measures for relief and rehabilitation. Lack of transparency and clarity between the Centre and the State Government on the issues of relief and rehabilitation made the case more complicated. The Central Government was unable to solve the case and was only in the state of discussion.

Regarding the disaster, the Government tried to provide support service in four areas: - medical, economic, social and environmental, which failed. Regarding medical rehabilitation, the government failed to provide essential medicines and infrastructural support in government hospitals. The fund for economic rehabilitation was mostly unutilized or misutilised. The Government allocated substantial fund to provide alternative livelihood for the gas affected people, but very few were provided livelihood opportunity. Social rehabilitation such as construction of houses for the victims and providing milk to children, pregnant and lactating mothers also failed. Rs 23.76 crores were allocated for environmental rehabilitation of which only Rs 3 crores were budgeted for construction of 80,000 smokeless chulhas, which were not spent for the purpose.

NEED FOR CORPORATE SOCIAL RESPONSIBILITY

Dow from the beginning of take over, ensured that there were no outstanding liabilities in relation to Bhopal. It did not take any responsibility for the tragedy, as well as cleaning up the site and ground water, medical monitoring, economic compensation and rehabilitation for the victims. It put the entire responsibility on the Government and freed itself from taking any legal obligation saying that they wanted to protect their shareholders interest. According to Dow, resolving outstanding cases would lead to legal risks which showed there runaway motive. At the 2003 annual shareholder meeting William S Stavropoulos, CEO of Dow Chemicals, stated that the case of disaster had been resolved in court and thus they are not liable for it any further.

Knowing the fact the unit manufactured dangerous chemicals in the heart of the city of Bhopal without adequate safety measures. After the disaster, the governmental bodies were also reluctant to react about poisonous effects of MIC. The management of the organisation as well as the regulatory bodies failed to look into the environmental and safety aspects.

Having seen the impact of negligence, Bhopal Gas Leak Disaster (Processing of Claims) Act, 1985 and Environmental Protection Act of 1986 were enacted. Though the former Act gave all powers to the Central Government to represent all claimants in appropriate forums, appreciable result did not come out even after 20 years. Thus the motive of the Company were clear. They had no humanitarian feelings, which called for proper and structured corporate social responsibility (CSR) approach to deal with the case.

Corporate Social Responsibility is concerned with treating the stakeholders of the firm ethically or in a socially responsible manner. Stakeholders exist both within a firm and outside. Consequently, behaving socially responsible would increase the human development of stakeholders both within and outside the corporation. {Source: Michael Hopkins: A Planetary Bargain: Corporate Social Responsibility Comes of Age (Macmillan, UK, 1998)}⁷

Dow, further had a long history of criminal behaviour earlier. It had been involved in precipitating two of the greatest industrial disasters of the twentieth century. Gauley Bridge tunneling project in West Virginia in the 1920s caused injury to hundreds from silicosis. According to the US Public Interest Research Group (PIRG) UCC was among the top four companies for toxic waste dumps in the US. It was a supplier of napalm and other chemical warfare agents to the US war in Vietnam.

ROAD AHEAD

The company should have been more responsive towards corporate accountability, human rights and the environment. Apart from the company, the Government should also have had a clear cut policy regarding a proactive Disaster Management Plan in order to prevent recurrence of such incidents. Strong community participation along with well structured disaster management plan was essential in order to deal with such disasters. Dow being financially sound should have been more responsible towards socio, economic and environmental issues. Hence, for Dow, it was high time to take some positive action and proper CSR approach towards human rights.

⁷ <http://www.mhcinternational.com/glossary>

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ANNEXURE

ANNEXURE 1 :

Methyl Isocyanate (MIC)

Common name	isocyanic acid, methylester and methyl carbylamine
Molecular mass	57.1
Properties	<ol style="list-style-type: none">1. Melting Point : -45°C ; Boiling Point: 43-45°C2. Volatile liquid with a sharp pungent odour.3. Reacts violently with water and is highly flammable.4. MIC vapour is denser than air and will collect and stay at low areas. The vapour mixes well with air and explosives mixtures are formed.5. May polymerize due to heating or under the influence of water and catalysts.6. Decomposes on heating and produces toxic gases like hydrogen cyanide, nitrogen oxides and carbon monoxide.
Uses	Used in the production of synthetic rubber, adhesives, pesticides and herbicide Intermediates. It is also used for the conversion of aldoximes to nitriles
Side Effects	MIC is extremely toxic by inhalation, ingestion and skin absorption. Inhalation of MIC causes cough, dizziness, shortness of breath, sore throat and unconsciousness. It is corrosive to the skin and eyes. Short term exposures also leads to death or adverse effects like pulmonary edema (respiratory inflammation), bronchitis, bronchial pneumonia and reproductive effects. The Occupational Safety and Health Administration's permissible exposure limit to MIC over a normal 8hr workday or a 40 hr workweek is 0.05mg/m ³ .

Source: http://www.chm.bris.ac.uk/webprojects2002/tan/methyl_isocyanate.htm

ANNEXURE 2:

The chilling statistics of a continuing tragedy:

- o More than 8,000 people killed due to exposure to the lethal gasses in the immediate aftermath of the disaster.
- o More than 500,000 people exposed to the poison gasses left to suffer a lifetime of ill health and mental trauma.
- o Nearly 30 people continue to die from exposure-related illnesses every month.
- o At least 1, 50,000 people, including children born to gas-exposed parents, suffer debilitating exposure-related health effects.
- o Tons of poisonous pesticides and other hazardous wastes lying scattered and abandoned in the DOW Carbide factory premises, insidiously poisoning the ground water and contaminating the land.

Source : www.greenpeace.org/india_en/multimedia/download/1/643636/0/GP_India_RR_Exhibition.pdf -

ANNEXURE 3: HISTORY OF UNION CARBIDE CORPORATION

S.NO.	YEAR	EVENT
1.	1917	Union Carbide & Carbon Corporation is incorporated on November 1, 1917 and acquires the stock of: Linde Air Products Co.; National Carbon Co., Inc.; Prest-O-Lite Co., Inc.; and Union Carbide Company (formed in 1898).
2.	1919	George Curme files the first patent for commercial preparation of ethylene.
3.	1920	Union Carbide establishes Carbide and Carbon Chemicals Corporation; also, the first commercial ethylene plant is completed at Clendenin, W. Va. — the start of the petrochemical industry.
4.	1923	Eleven acres of land in South Charleston, W. Va. are leased to set up a commercial scale plant, which will — in a few years — begin production of several ethylene-based chemicals.
5.	1939	Bakelite Corporation merges into Union Carbide and Carbon Corporation. Bakelite, founded by Dr. Leo Baekeland, was a pioneer in plastics.
6.	1941	Chemical production begins at Texas City, Tex.
7.	1947	Union Carbide purchases plant in Institute, W. Va., which it had previously built and operated for the government for the production of butadiene and styrene at the start of World War II.
8.	1954	Chemical production at Seadrift, Tex. begins.
9.	1957	Union Carbide and Carbon Corporation changes name to Union Carbide Corporation.
10.	1959	Union Carbide Consumer Products Co. is formed as a division.
11.	1960'S	The Mining and Metals Division is formed by combining the Metals and Ore Divisions and part of the Nuclear Division. First chemical products are shipped from Taft, La. plant in 1966. Jennat Corporation, producer of latex, is purchased by Union Carbide. Electronics Division is established. Hydrocarbons Division is formed. Ferroalloys Division is formed and takes over production and marketing of chromium, manganese and silicon alloys.
12.	1977	UNIPOL Process technology for making polyethylene is announced.
13.	1978	Union Carbide completes major divestiture, selling nearly all of its European petrochemical operations to BP Chemicals Ltd.
14.	1981	Union Carbide sells portion of its metals business.
15.	1983	A major advance expanding the scope of the UNIPOL Process technology to include polypropylene is announced.
16.	1984	In December, a gas leak at a plant in Bhopal, India, caused by an act of sabotage, results in tragic loss of life.
17.	1985	In December, a gas leak at a plant in Bhopal, India, caused by an act of sabotage, results in tragic loss of life.
18.	1986	GAF halts takeover bid in response to Union Carbide's defense, which includes plans to make major divestitures. Union Carbide divests a number of businesses: films packaging, major portions of metals business, battery products, specialty polymers and composites, home and automotive products and agricultural products business. Union Carbide purchases Amerchol Corporation from CPC International.
19.	1988	Allied-Signal and Union Carbide complete the formation of UOP joint venture. UOP provides process technology, catalysts and adsorbents to the petroleum refining, petrochemical, gas-processing and energy industries.
20.	1989	Carbon products and industrial gases businesses become subsidiaries on Jan. 1st. Carbon products business is renamed UCAR Carbon Company and industrial gas business is named Union Carbide Industrial Gases Inc. On July 1st Union Carbide Corporation becomes a holding company, owning these two subsidiaries plus Union Carbide Chemicals and Plastics Company, Inc.
21.	1990	Urethane polyether polyols and propylene glycol business is sold to Arco Chemical Co. UCC purchases Triton surfactant and alkylphenol business from Rohm & Haas.
22.	1991	Mitsubishi Corporation buys 50% stake in UCAR Carbon; UCAR Carbon later becomes a publicly traded independent company.
23.	1992	Union Carbide Industrial Gases is spun-off as an independent company. Its name changes to Praxair, Inc.
24.	1993	OrganoSilicon Products business is sold to DLJ Merchant Banking Partners L.P. and affiliates of Donaldson, Lufkin & Jenrette, Inc.
25.	1994	Alberta & Orient Glycol Company Ltd. opens a 660,000 lbs. per year ethylene glycol plant at Red Deer, Alberta, Canada. Alberta & Orient Glycol is a joint venture between Union Carbide (50%), Far Eastern Textile Ltd. (25%) and Mitsui & Company Ltd. (25%). Sale of Union Carbide's 50.9% interest in Union Carbide India Limited to McLeod Russel is completed.

26.	1995	UCC acquires ethylene oxide and derivatives businesses, including facilities in the United Kingdom, from ICI. Union Carbide becomes a partner in Polimeri Europa S.r.l., a 50-50 ethylene/polyethylene joint venture between Union Carbide and EniChem S.p.A.. It will produce polyethylene for the European market. Union Carbide forms Asian Acetyls Company, Ltd. a joint venture in Korea with BP Chemicals and Samsung Fine Chemicals Company to manufacture vinyl acetate monomer. Union Carbide and two partners (Petrochemical Industries Company and Boubyan Petrochemical, both of Kuwait) form Equate Petrochemical Company. The new firm will build and operate a petrochemicals complex in Kuwait; products include ethylene, polyethylene and ethylene glycol.
27.	1996	Purchase of the polypropylene assets and business of Shell Oil Company is completed. Plans for Union Carbide and Nova Corporation to build a 2.8-billion pound ethylene plant in Alberta, Canada are announced. Union Carbide will build a Unipol Process polyethylene plant to consume its half of the output.
28.	1997	Union Carbide and Exxon Chemical Company launch a joint venture, Univation Technologies, for the licensing of polyethylene technology and for research, development and commercialization of metallocene and other advanced catalysts for the production of polyethylene. The venture is also the licensing agent for Union Carbide's UNIPOL Process technology for polypropylene.
29.	1998	UCC and Petronas (the national oil company of Malaysia) form a joint venture to build a new petrochemical complex in Malaysia. The planned complex will include an olefins cracker and have facilities for production of ethylene oxide and its derivatives and oxo alcohols and oxo derivatives, primarily serving solvents and intermediates end-uses.
30.	1999	On August 4th, Union Carbide and The Dow Chemical Company announce that their boards of directors have approved an \$11.6 billion transaction which would result in Union Carbide becoming a wholly owned subsidiary of The Dow Chemical Company.
30.	2001	On February 6th, Union Carbide Corporation became a wholly owned subsidiary of The Dow Chemical Company.

Source: <http://www.unioncarbide.com/history/>

ANNEXURE 4:

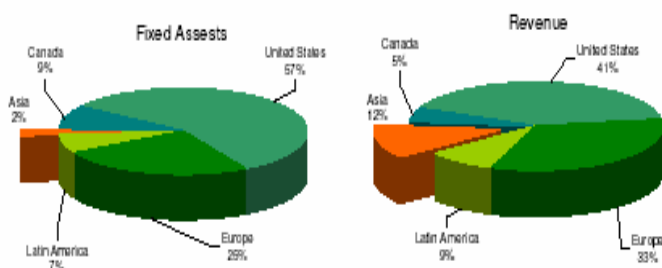


Figure 1. Breakdown of Dow's Fixed Assets and Revenue by Region
(Source: William S. Stravopoulos, Chairman and CEO, Dow Chemical, Presentation to Morgan Stanley Conference, Feb. 24, 2004)

ANNEXURE 5: Source: Rural Advancement Foundation International, www.thebestcontrol.com/bugstop/author_companies.htm

The top 10 "AgChem Companies" by 1998 pesticide sales in U. S. millions:

BASF	\$1,945
Dow	\$2,132
Bayer	\$2,273
DuPont	\$3,156
Aventis	\$4,676
Novartis	\$4,152
Monsanto	\$4,032
AstraZeneca	\$2,897
American Home Products	\$2,194
Makhteshim-Agan	\$801

EXHIBITS

EXHIBIT 1:

Financial report

Income Statement	Quarter Ending Mar 04	Quarter Ending Dec 03	Quarter Ending Sep 03	Quarter Ending Jun 03	Quarter Ending Mar 03
Revenue	9,309.0	8,332.0	7,977.0	8,242.0	8,081.0
Cost of Goods Sold	7,422.0	6,700.0	6,409.0	6,520.0	6,708.0
Gross Profit	1,887.0	1,632.0	1,568.0	1,722.0	1,373.0
Gross Profit Margin	20.3%	19.6%	19.7%	20.9%	17.0%
SG&A Expense	614.0	600.0	581.0	600.0	592.0
Depreciation & Amortization	514.0	502.0	466.0	465.0	470.0
Operating Income	759.0	530.0	521.0	657.0	311.0
Operating Margin	8.2%	6.4%	6.5%	8.0%	3.8%
Nonoperating Income	130.0	182.0	165.0	160.0	53.0
Nonoperating Expenses	186.0	202.0	204.0	207.0	215.0
Income Before Taxes	703.0	510.0	482.0	610.0	149.0
Income Taxes	204.0	(442.0)	127.0	186.0	47.0
Net Income After Taxes	499.0	952.0	355.0	424.0	102.0
Continuing Operations	469.0	929.0	332.0	393.0	85.0
Discontinued Operations	0.0	0.0	0.0	0.0	0.0
Total Operations	469.0	929.0	332.0	393.0	85.0
Total Net Income	469.0	929.0	332.0	393.0	76.0
Net Profit Margin	5.0%	11.1%	4.2%	4.8%	0.9%
Diluted EPS from Continuing Operations (\$)	0.50	1.00	0.36	0.43	0.09
Diluted EPS from Discontinued Operations (\$)	0.00	0.00	0.00	0.00	0.00
Diluted EPS from Total Operations (\$)	0.50	1.00	0.36	0.43	0.09
Diluted EPS from Total Net Income (\$)	0.50	1.00	0.36	0.43	0.08
Dividends per Share	0.34	0.34	0.34	0.34	0.34
Balance Sheet	Quarter Ending Mar 04	Quarter Ending Dec 03	Quarter Ending Sep 03	Quarter Ending Jun 03	Quarter Ending Mar 03
Assets					
Current Assets					
Cash	1,926.0	2,392.0	2,566.0	2,276.0	1,931.0

Net Receivables	6,380.0	5,820.0	5,328.0	5,521.0	5,276.0
Inventories	4,325.0	4,050.0	4,167.0	4,235.0	4,229.0
Other Current Assets	601.0	740.0	180.0	218.0	259.0
Total Current Assets	13,232.0	13,002.0	12,241.0	12,250.0	11,695.0
Net Fixed Assets	13,936.0	14,217.0	13,510.0	13,654.0	13,666.0
Other Noncurrent Assets	14,714.0	14,672.0	14,554.0	14,593.0	14,526.0
Total Assets	41,882.0	41,891.0	40,305.0	40,497.0	39,887.0
Liabilities and Shareholders' Equity					
Current Liabilities					
Accounts Payable	5,224.0	4,884.0	4,588.0	2,578.0	2,898.0
Short-Term Debt	1,305.0	1,346.0	1,457.0	1,846.0	1,391.0
Other Current Liabilities	3,018.0	3,304.0	3,108.0	5,163.0	4,762.0
Total Current Liabilities	9,547.0	9,534.0	9,153.0	9,587.0	9,051.0
Long-Term Debt	11,799.0	11,763.0	11,695.0	11,636.0	12,045.0
Other Noncurrent Liabilities	8,529.0	8,919.0	9,012.0	8,976.0	8,892.0
Total Liabilities	32,403.0	32,716.0	32,345.0	32,647.0	32,348.0
Shareholders' Equity					
Preferred Stock Equity	0.0	0.0	0.0	0.0	0.0
Common Stock Equity	9,479.0	9,175.0	7,960.0	7,850.0	7,539.0
Total Equity	9,479.0	9,175.0	7,960.0	7,850.0	7,539.0
Shares Outstanding (mil.)	931.9	927.4	920.5	915.5	915.5
Cumulative Cash Flow Statement					
	Quarter Ending Mar 04	Quarter Ending Dec 03	Quarter Ending Sep 03	Quarter Ending Jun 03	Quarter Ending Mar 03
Net Operating Cash Flow	95.0	3,780.0	2,730.0	1,662.0	826.0
Net Investing Cash Flow	(398.0)	(1,676.0)	(792.0)	(571.0)	(337.0)
Net Financing Cash Flow	(163.0)	(1,225.0)	(931.0)	(327.0)	(53.0)
Net Change in Cash	(466.0)	908.0	1,082.0	792.0	447.0
Depreciation & Amortization	514.0	502.0	466.0	465.0	470.0
Capital Expenditures	(350.0)	(1,110.0)	(759.0)	(495.0)	(223.0)
Cash Dividends Paid	(310.0)	(1,229.0)	(920.0)	(612.0)	(306.0)

Source : Corporate Information : The Dow Chemical Company,
www.chemchannels.com/chemchannel/homepage/General/Firstfifty/Dow.php

EXHIBIT 2

Top Competitors :

	Dow Chemical Co	BASF AG	E.I. Du Pont De Nemours & Co (DuPont)	Exxon Mobil Corp	Industry
Market Cap:	37.35B	28.33B	43.21B	282.86B	1.10B
Employees:	46,372	87,159	81,000	88,300	4.30K
Rev. Growth (ttm):	18.20%	16.90%	13.10%	20.70%	9.40%
Revenue (ttm):	33.86B	41.01B	28.75B	250.56B	1.58B
Gross Margin (ttm):	14.59%	30.25%	27.10%	28.55%	15.71%
EBITDA (ttm):	3.09B	6.63B	1.73B	40.50B	80.54M
Oper. Margins (ttm):	8.90%	8.20%	0.45%	12.39%	5.24%
Net Income (ttm):	2.12B	1.20B	1.10B	19.91B	25.26M
EPS (ttm):	2.276	2.152	1.088	3.008	0.38
PE (ttm):	17.53	23.79	39.71	14.38	26.93
PEG (ttm):	2.60	2.70	1.94	1.97	2.60
PS (ttm):	1.10	0.70	1.50	1.13	0.64

Dow Vs. Industry Leaders :

Statistic	Industry Leader	DOW	DOW Rank
Market Capitalization	DD	43.21B	37.35B 2 / 19
P/E Ratio (ttm)	NCX	70.26	17.53 9 / 19
PEG Ratio (ttm, 5 yr expected)	MCH	11.80	2.60 5 / 19
Revenue Growth (Qtrly YoY)	BYH	171.33%	15.20% 6 / 19
EPS Growth (Qtrly YoY)	DOW	434.41%	- 1 / 19
Long-Term Growth Rate (5 yr)	ROG	20.0%	7.0% 6 / 19
Return on Equity (ttm)	HPC	2866.67%	25.27% 2 / 19
Long-Term Debt/Equity (mrq)	HPC	16.782	1.382 5 / 19
Dividend Yield (annual)	EMN	3.80%	3.36% 2 / 19

EXHIBIT 3

**FINANCIAL
HIGHLIGHTS :**

Fiscal Year		Profitability		Management Effectiveness	
Fiscal Year Ends :	31-Dec	Profit Margin (ttm):	6.59%	Return on Assets (ttm):	5.45%
Most Recent Quarter (mrq):	31-Mar-04	Operating Margin (ttm):	8.90%	Return on Equity (ttm):	25.27%

	2003	2002	2001	2000
Annual Sales (\$ mil.)	32632.0	27609.0	27805.0	23008.0
Annual Net Income	1730.0	338.0	385.0	1513.0

